



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/534,843

05/13/2005

Takeshi Fujimatsu

MAT-8685US

8949

23122 7590 04/10/2008
RATNERPRESTIA
P O BOX 980
VALLEY FORGE, PA 19482-0980

EXAMINER

REDDING, THOMAS M

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

04/10/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

Response to Amendment

Applicant's response received on 2/5/2008 is fully considered herein. Claims 1-25 are currently pending.

Specification

In response to applicant's amendment of the specification removing the reference to claim 1, the objection is withdrawn.

Claim Rejections - 35 USC § 101

In response to applicant's amendment of claim 21 to a statutory form, the 35 USC § 101 rejection is withdrawn.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 1-6, and 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda et al. (US 6,850,631 B1).

Regarding claim 1, Oda discloses [a]n eye image pickup device comprising: an eye image pickup unit for capturing an eye image ("A photographing device 3 for

photographing an iris 7", Oda, column 2, line 59 and figure 1); and a display unit for displaying the display image formed by the display image formation unit ("The geometrical pattern is colored and displayed on the monitor", Oda, column 8, line 66, and figure 1)

While Oda does teach a display image formation unit for forming a display image from the eye image by degrading an at least iris-containing area in the eye image ("the iris image is converted into a geometrical pattern", Oda, column 8, line 65, and figure 6, No 1), Oda does not explicitly teach retaining a shape of the iris containing area. However in figure 5(A), Oda does teach a mapping from a circular image of an iris (51) to a circular form in the display (54). It would have been obvious to one of ordinary skill in the art at the time the invention was made that Oda's displayed circle retains the shape of the iris.

Regarding claim 2, Oda discloses [a]n authentication device comprising:
the eye image pickup device according to claim 1;
an authentication information formation unit for forming authentication information from the eye image of a user to be authenticated entered from the eye image pickup unit ("The CPU 35 then converts the image signal for the iris image inputted to the image input unit 39 to code that can recognize an individual using an iris pattern processing program pre-stored in the memory 36", Oda, column 6, line 25); and an authentication unit for authenticating the user by comparing and collating the authentication information with registered authentication information which has been registered

previously (“a recognition unit for registering or collating information relating to an iris based on the iris image acquired by the photographing device”, Oda, column 8, line 41).

Regarding claim 3, Oda discloses [t]he authentication device according to claim 2, wherein the display image formation unit forms a display image used for guiding the user about an eye position (“FIG. 5 is a view showing how images of an eye and geometrical patterns correspond”, Oda, column 9, line 3 and figure 5); and the authentication information formation unit forms the authentication information from the eye image of the user (“The CPU 35 then converts the image signal for the iris image inputted to the image input unit 39 to code that can recognize an individual using an iris pattern processing program pre-stored in the memory 36”, Oda, column 6, line 25), the eye image being guided to one of a specified position and a specified region by the display image on the display unit (“The person to be identified 8 then moves the photographing device 3 backwards and forwards while looking at the iris image of the right eye outputted at the monitor 2”, Oda, column 7, line 9).

Regarding claim 4, Oda discloses [t]he authentication device according to claim 2 further comprising:
an authentication information registration unit for registering, as registered authentication information, the authentication information formed from the eye image of the user, wherein

the display image formation unit forms a display image for determining whether the eye image of the user should be registered or not (“the iris image input device of the present invention can show portions represented as a geometrical pattern in, for example, green or blue when the focal point of the iris image is in focus or in red when the focal point of the iris image is not in focus”, Oda, column 9, line 35); and

the authentication information registration unit registers the authentication information as the registered authentication information after the display image formed by the display image formation unit is displayed on the display unit (“determines whether the process is a "register iris" process”, Oda, column 7, line 58).

Regarding claim 5, Oda discloses [t]he authentication device according to claim 2, wherein the display image formation unit forms the display image by selectively applying an image process to the at least iris-containing area in the eye image (“the iris image is converted into a geometrical pattern”, Oda, column 8, line 65)

Regarding claim 6, Oda discloses [t]he authentication device according to claim 5, wherein the authentication information formation unit comprises: an eye position detection unit for detecting an eye position from the eye image (“First, the CPU 35 specifies the position of a dark portion 51 (a portion including the iris 7 and a pupil 52) from the left image (photographed image of an eye)”, Oda, column 9, line 12); and an eyelid position detection unit for detecting an eyelid position from the eye image (“Of the images for eyes shown on the left side of FIG. 5, image (A) shows an ideal situation where an eye is wide open, image (B) shows a situation where an eye is narrowed or is

an eye of a person with narrow eyes, where the iris 7 is slightly concealed by upper and lower eyelids when compared with (A), and image (C) shows the situation when looking upwards, with the iris substantially covered by an upper eyelid”, Oda, column 9, line 4. Oda provides feedback related to eyelid position); and the display image formation unit determines the at least iris-containing area in the eye image from the eye position and the eyelid position, and selectively performs the image process (“the iris image is converted into a geometrical pattern”, Oda, column 8, line 65).

Regarding claim 17, Oda discloses [t]he authentication device according to claim 5, wherein the display image formation unit forms a display image by replacing the at least iris-containing area in the eye image with a specified image (“the iris image is converted into a geometrical pattern”, Oda, column 8, line 65).

Regarding claim 18, Oda discloses [t]he authentication device according to claim 2 further comprising: an image quality determination unit for determining whether an eye image captured by the eye image pickup unit is adequate in quality or not (“the iris image input device of the present invention can show portions represented as a geometrical pattern in, for example, green or blue when the focal point of the iris image is in focus or in red when the focal point of the iris image is not in focus”, Oda, column 9, line 35), wherein the authentication information formation unit forms the authentication information of an eye image which has been determined to be adequate in quality by the image quality determination unit (“In step S5, after detecting pressing and releasing

of the switch 5, the CPU 35 has the memory 36 continue to store iris images to for a prescribed number of images, extracts an iris image that satisfies the conditions for use in registration or collation from the iris images for the prescribed number of frames stored in the memory 36, converts the extracted iris image into signal data for recognizing an individual and stores the iris image and signal data in the memory 36", Oda, column 7, line 27, Oda's conditions discard images that are not of sufficient quality).

Regarding claim 19, Oda discloses [a]n authentication device comprising:

- an eye image pickup unit for capturing an eye image of a user to be authenticated (Oda figure 1);
- an authentication information formation unit for forming authentication information of the eye image of the user ("The CPU 35 then converts the image signal for the iris image inputted to the image input unit 39 to code that can recognize an individual using an iris pattern processing program pre-stored in the memory 36", Oda, column 6, line 25);
- an authentication information registration unit for registering the authentication information as registered authentication information ("a recognition unit for registering or collating information relating to an iris based on the iris image acquired by the photographing device", Oda, column 8, line 41);
- authentication unit for authenticating the user by comparing and collating the authentication information with registered authentication information which has been registered previously ("a recognition unit for registering or collating information relating

to an iris based on the iris image acquired by the photographing device”, Oda, column 8, line 41);

display image formation unit for forming a display image by degrading an at least iris-containing area in the eye image with a condition of retaining a shape of the Iris-containing area (“the iris image is converted into a geometrical pattern”, Oda, column 8, line 65 and figure 6, No 1, The pattern Oda displays for a good position is a circle which does match the shape of the iris).; and

a display unit for displaying the display image, wherein the display image formation unit forms the display image and makes the display unit display the display image at least one of when the user is guided (Oda, figure 6, geometric pattern displayed indicates the state of the eye) and when the authentication information registration unit registers the authentication information as the registered authentication information (Oda, figure 9, s11, display collation results on monitor)

Regarding claim 20, Oda discloses [a]n image processing method comprising: a first step of cutting out an at least iris-containing area from an eye image (“converts the extracted iris image into signal data for recognizing an individual”, Oda, column 7, line 29); and a second step of selectively degrading an image of the iris-containing area cut out in the first step with a condition of retaining a shape of the iris-containing area (“the iris image is converted into a geometrical pattern”, Oda, column 8, line 65 and figure 6, No 1, The pattern Oda displays for a good position is a circle which does match the shape of the iris).

Regarding claim 21, Oda discloses [a] a computer readable medium executable by a computer for executing the steps of: a first step of cutting out an at least iris-containing area from an eye image; and a second step of selectively degrading an image of the iris-containing area cut out in the first step with a condition of retaining a shape of the iris-containing area (Oda discloses steps 1 and 2 as discussed in the rejection of claim 1 above. Oda's system is controlled by a CPU which is in turn controlled via software, figure 3 CPU and "executed by the CPU 35 based on a control program stored in the memory 36", Oda, column 10, line 63).

3. Claims 22 - 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda et al. (US 6,850,631 B1).

Regarding claims 22 -25, Oda discloses further comprising: an eye position detection unit for detecting an iris-pupil area from the eye image ("the CPU 35 specifies the position of a dark portion 51 (a portion including the iris 7 and a pupil 52) from the left image (photographed image of an eye, Oda, column 9, line 12)";

and

Oda does not explicitly teach an eyelid position detection unit for detecting an eyelid area from the eye image, wherein the display image formation unit determines the iris-containing area by subtracting the eyelid area detected by the eyelid position

detection unit from the eye image captured by image pickup unit and calculating an area which overlaps with the iris-pupil area detected by the eye position detection unit.

Oda does teach the concept of an eyelid position detection unit for detecting an eyelid area from the eye image, wherein the display image formation unit determines the iris-containing area by subtracting the eyelid area detected by the eyelid position detection unit from the eye image captured by image pickup unit and calculating an area which overlaps with the iris-pupil area detected by the eye position detection unit ("Next, the CPU 35 obtains the contour of the dark portion 51. The CPU 35 can obtain the contour of the dark portion 51 by looking for areas where the difference in brightness is large because there is a substantial difference in brightness between the dark portion 51 and a peripheral white of the eye portion 53", Oda, column 9, line 19, the contour of Oda's dark area is bounded by both the white of the eye and possibly the edges of the eyelid, both should appear as differences in brightness with the dark iris/pupil area).

It would have been obvious at the time the invention was made for one of ordinary skill in the art to apply the boundary calculation method of Oda to include separating the eyelid area from the iris in order to "acquire iris code for a person to be identified in a rapid and accurate manner" (Oda, column 21, line 20). The signal of interest to Oda is the pattern of the iris and as described above, Oda does separate the iris-pupil area from the peripheral white of the eye portion, it would be natural to also exclude any portion of the eyelid that intrudes upon the iris image.

4. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda et al. (US 6,850,631 B1) and Official Notice.

Regarding claims 11 and 12, Oda teaches all the elements of claims 2 and 5 as given above. Oda does not explicitly teach wherein the display image formation unit forms a display image by reducing a number of pixels composing the eye image.

It is well known in the art of programming, to allow resizing of image windows and their contents. Reducing an image in size requires reducing the number of pixels displayed (Official Notice).

It would have been obvious at the time the invention was made to provide image resizing capabilities to the iris recognition system of Oda for the user's convenience and to provide normal windowing functionality.

5. Claims 7-10, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda et al. (US 6,850,631 B1) in combination with Bonneau, Jr. (US 5,581,620).

Regarding claims 7-10, Oda teaches all the elements of claims 2 and 5 as disclosed above. Oda does not teach wherein the display image formation unit forms a display image by subjecting the eye image to compression, wherein the compression is JPEG compression.

Bonneau, Jr., working in the same field of endeavor of personal identification does teach a display image formation unit forms a display image by subjecting the eye image to compression, wherein the compression is JPEG compression ("In accordance with this embodiment, optical card media 13 stores the customer's eye retina pattern data or finger print data in a compressed image format, such as the JPEG format or similar image compression format", Bonneau, column 6, line 8).

It would have been obvious at the time the invention was made to use JPEG compression as taught by Bonneau. in combination with the iris recognition system of Oda in order to solve an image storage problem identified by Oda ("If the memory 36 becomes full, old iris images are deleted and new iris images are stored", Oda, column 11, line 57). JPEG compression would permit Oda to store more images.

Regarding claims 13 and 14, the combination of Oda and Bonneau teaches wherein the display image formation unit forms a display image by adding specified noise to the eye image (Bonneau teaches JPEG compression as discussed above. JPEG introduces noise, particularly at higher compression. "In DCT-based video/image compression, such as MPEG or JPEG, a low bit rate (high compression) for efficient transmission or storage is known to cause annoying artifacts, such as mosquito-noise, block noise, etc", Oizumi et al, paragraph 4. The nature of JPEG will introduce some noise if the compression is high enough).

6. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda et al. (US 6,850,631 B1) and Bonneau, Jr. (US 5,581,620), supplemented by Oizumi et al. (US 2005/0025381) as evidentiary support.

Regarding claims 15 and 16, the combination of Oda and Bonneau as disclosed above in the discussion of claims 13 and 14 does teach wherein the display image formation unit forms a display image by subjecting the eye image to at least two image processes out of reducing a number of pixels composing the eye image, compressing the eye image, and adding specified noise to the eye image (as discussed previously, the use of JPEG already adds noise to the image " In DCT-based video/image compression, such as MPEG or JPEG, a low bit rate (high compression) for efficient transmission or storage is known to cause annoying artifacts, such as mosquito-noise, block noise, etc", Oizumi et al, paragraph 4).

Response to Arguments

Summary of Applicant's Remarks: Regarding claims 1, 19-21 and claims 2-18 and 22-25 by dependency, the originally cited art does not teach degrading an at least iris-containing area in the eye image with a condition of retaining a shape of the iris-containing area.

Examiner's Response: See the updated rejection above. While Oda does substitute a geometric shape for the iris, he is substituting a circular shape which does correspond to the normal shape of the iris. Therefore Oda retains the shape of the iris-containing area.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS M. REDDING whose telephone number is (571)270-1579. The examiner can normally be reached on Mon - Fri 7:30 am - 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571) 272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/T. M. R./
Examiner, Art Unit 2624

/Vikkram Bali/
Supervisory Patent Examiner, Art Unit 2624